Abstracts of the Final Network Meeting of COST Action FA0906 UV4growth

Bled, Slovenia, 30 March – 2 April 2014

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Sunlight, in its many guises, is the force that has shaped and driven the miraculous living fabric of this planet for billions years. It embodies the best engineering, the widest safety margins, and the greatest design we experience now. It provides amply for our needs, yet limits our greed… It is safe, eternal, universal and free.

Theodore B. Taylor, Sceptic (1977)

UV-B radiation alters interactions between photosynthesis and secondary metabolism in variegated *Plectranthus coleoides*

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This study is based on the results obtained from the experiments conducted within two Short Term Science Missions (STSMs) in the Research Unit Environmental Simulation, Helmholtz Zentrum München during 2011 and 2012. Our aim was to investigate the effects of realistic UV-B doses on photosynthesis and secondary metabolism in variegated leaves. Variegated *Plectranthus coleoides* plants were exposed to UV-B radiation (0.90 W m^{-2}) under two photosynthetic active radiation (PAR) intensities (LL: 395 and HL: 1350 µmol m^{-2} s^{-1}) for nine days in the sun simulators at the Helmholtz Zentrum München. In the green leaf portions, UV-B radiation stimulated photosynthetic rates in *P. coleoides* at both PAR intensities and doubled the size of plastoglobuli whereas the contents of photosynthetic pigments were slightly increased at HL. The concentrations of phenylpropanoids, catechins and hydroxybenzoic acids, were preferentially accumulated in green leaf portions, independently on radiation regimes. A hallmark of UV-B induced changes in plant metabolism, the induction of flavonoid pathway, was evidenced in *P. coleoides* by accumulation of apigenin and cyanidin glycosides in the whole leaf at both background PARs. UV-B induced accumulation of apigenin and cyanidin glycosides was more pronounced in the white leaf portions, compared to green one. Moreover, we observed differential response of H_2O_2 scavenging system to high PAR and UV-B in relation to tissue type. Alteration of linear electron flow, provoked by acclimation to UV-B at HL was associated with decreased ascorbate redox state and APX activity. In summary, UV-B radiation stimulated CO_2 assimilation and increased fixed carbon flow into photosynthetic pigments, phenylpropanoids and flavonoids/anthocyanins which might be important for photoprotection of photosynthetic machinery under high light intensity.

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